Title: Using Machine Learning to Identify High Impact Incidents in Automatic Incident Detection (AID) System Generated Alarms

PRESENTER:
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BACKGROUND

Video-based AID has evolved rapidly in the last several years with significant improvements in video quality and computing resources, with a substantially improved potential for automating the detection process, especially under low volume conditions.
However, these AID technologies **still struggle to separate out vehicles stopped on the road due to recurrent congestion or pulled over on the shoulder from vehicles stopped due to an incident.** Hence, the number of false alarms (or non-critical alarms) remains unmanageably high.

VIDEO BASED AID ALARMS


Stopped incident


Pedestrian incident

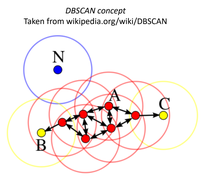

Slow incident

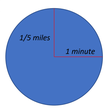

Congestion incident


Wrong-way incident

METHODS

1. Investigation of clustering and evolution patterns of the appearance of alarms over time and space





2. Development of a clustering algorithm for cluster identification with supervised learning

3. Selection of optimal parameters of the machine learning algorithm to distill out the potential high-impact incidents from congestion-related or non-critical stops and slowdowns

CONCLUSION

The 159-combination approach generated 129 unique (1804 total) non-relevant clusters that are not associated with significant incidents. The average time-to-detect for the 12 incidents (whose average duration is 35.57 minutes) was 11.59 minutes.

New Approach on top of Incident alarms generated by AID system on I-475 with the developed clustering algorithm distinguishes critical incident clusters over non-relevant clusters at 100% detection rates.

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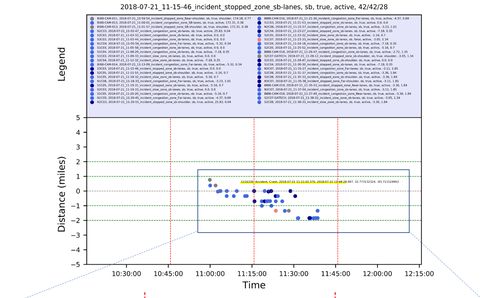
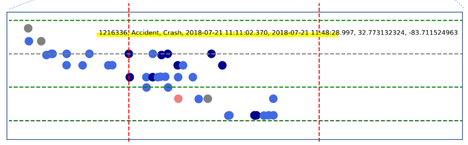
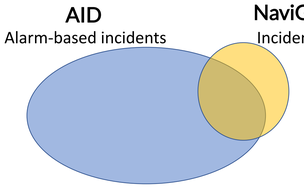
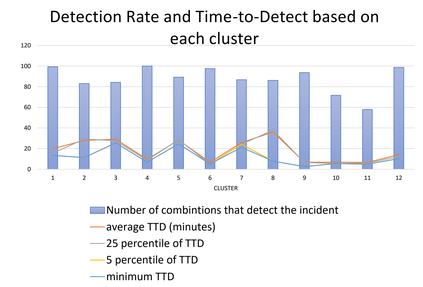
AID and GEORGIA 511 NaviGAtor

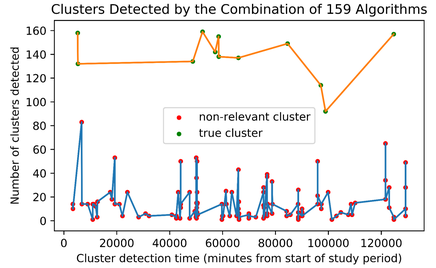






PERFORMANCE MEASURES on CLUSTERING ALGORITHM





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